UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 January 2008</u>.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-19</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-4, 6-9 and 11-19</u> is/are rejected.

7)☒ Claim(s) <u>5 and 10</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Eexaminer's Note

Throughout this Office Action, unless otherwise noted, the following notations are

used for identifying the place of cited texts in a reference:

c:m-n: "column c lines m-n" for (usually) a US patent;
p.p&m-n: "page p line m-n" for (usually) a foreign patent or paten application
[p]/m-n: "paragraph p lines m-n" for (usually) a US patent application publication

Note also that in the following discussion the term "digital-audio" is used where

necessary for Applicant's "digital audio". This is purely for the convenience of concise

and combined writing where "digital audio data" is presented together with "digital data".

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1 – 4, 6 – 9, 17 and 18 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Boduch et al (US 6,667,954, Boduch hereinafter) in view of

Humphrey et al (US 6,246,681, Humphrey hereinafter).

Boduch provides a "method and apparatus for selecting the better of two or more

copies of any given cell from the received cell streams" (2:28-30) comprising the

following features:

- **With respect to Independent claims 1/18**

Regarding claim 1 / 18, Boduch discloses *a fault-tolerant router* (see "a cell-

oriented redundant switching system", Abstract line 3 and fig. 1), *comprising:*

a *first router matrix card* (fig. 1 item 107 and see "there are two copies of a

redundant switch network, switch network copy 107", 3:38-39), *said first router matrix*

card receiving N input digital-audio / digital data streams (fig. 1 item 105 depicted as

input to "copy 107 and see "signals 105 ... are characterized as composite <u>cell</u>

<u>streams</u>", 3:48-49) *and generating, from N said input digital-audio / digital data streams,*

a first set of M output digital-audio / digital streams (fig. 1 item 111 depicted as *output*

from "copy 107" and see "signals ... 111 ... are characterized as composite <u>cell</u>

<u>streams</u>", 3:48-49, and see more specifically "After signal 105 is <u>input</u> to switch network

copy 107, the signal is routed through switch network copy 107 and <u>output</u> as signal

111", 3:59-62);

a *second router matrix card* (fig. 1 item 108 and see "there are two copies of a

redundant switch network, ... and switch network copy 108", 3:38-39), *said second*

router matrix card receiving said N input digital-audio / digital data streams (fig. 1 item

106 depicted as *input* to "copy 108 and see "signals ... 106 ... are characterized as

composite <u>cell streams</u>", 3:48-49, noting also fig. 1 "Ingress Port Module 104" which

"splits the signal 103 into two <u>identical</u> signals, signal 105 and 106", 3:42-44) *and*

generating, from said N input digital-audio / digital data streams, a second set of M

output digital-audio / digital streams (fig. 1 item 112 depicted as *output* from "copy 108"

and see "signals ... 112 ... are characterized as composite <u>cell streams</u>", 3:48-49, and

more specifically "After signal 106 is <u>input</u> to switch network copy 108, the signal is

routed through switch network copy 108 and <u>output</u> as signal 112 3:62-64);

       an output card (fig. 1 "Egress Port Module 109") *coupled to said first router matrix*

card ("copy 107") *and said second router matrix card* ("copy 108"), *said output card*

receiving said first set of M output digital-audio / digital streams from said first router

matrix card and said second set of M output digital-audio / digital streams from said

second router matrix card (refer still to fig. 1 and see "Signals 111 and 112 are then

passed to the egress port module 109", 3:64-65), *providing, as an output therefrom, a*

selected one of said first and second sets of M output digital-audio / digital streams

(refer still to fig. 1 and see "The egress port module 109 determines whether signal 111

or signal 112 will be sent on to the customer's network as <u>output signal</u> 113", 3:65-67),

and switching from said selected one of said first and second sets of M output digital-

audio / digital data streams to an unselected one of said first and second sets of M

output digital-audio / digital data streams based upon detecting an error in said selected

one of said first and second sets of M output digital-audio / digital data streams (still

refer to figs. 1 and 2 and see "the best cell copy selection ASIC 110 invokes the copy

selector 206 to select the better of the two copies of each cell to be sent on to the

customer network. The term 'better' refers to the cell that arrives at egress port 109 of

FIG. 1 with <u>fewest errors</u>, and the <u>selection</u> is made on a <u>cell-by-cell basis</u>" 10:35-40,

noting that the term <u>cell-by-cell basis</u> will inevitably involving *switching from* previously

selected streams to previously *unselected streams*, depending on which of the two

copies of the next cell has <u>fewest errors</u> in it).

- **With respect to dependent claims**

Regarding claim 2, *wherein said output card* (fig. 1 "egress port module 109")

further comprises a switching circuit ("copy selector 206" of fig. 2, which "depicts a block

diagram of the cell stream alignment best cell copy selection ASIC 110", 4:44-46, refer

to fig. 1 for said ASIC 110) *coupled to receive said first set of M output digital audio data*

streams from said first router matrix card (fig. 1 data stream 111 from "switch network

copy 107) *and said second set of M output digital audio data streams from said second*

router matrix card (fig. 1 data stream 112 from "switch network copy 108), *said*

switching circuit switching from said selected one of said first and second sets of M

encoded output digital audio data streams to said unselected one of said first and

second sets of M output digital audio data streams (refer to fig. 2 and see "the copy

selector to select the better of the two copies of each cell to be sent on to the customer

network", 10:36-38) *in response to assertion of a switching signal* (refer to figs. 1 and 2

and see "the best cell copy selection ASIC 110 <u>invokes</u> the copy selector 206 to select",

10:35-36, noting that said <u>invoking</u> will have to involving in issuing an *assertion*).

Regarding claim 3, *wherein said output card* (fig. 1 "ASIC 110" within "egress

port module 109") *further comprises: a first/second* error *check circuit* (fig. 2 "cell

overhead extractor/monitor 201", which is the first circuit within the "best cell copy

selection ASIC 110" of fig. 1) *coupled to receive said first/second set of M output digital*

audio streams from said first/second router matrix card (see "The cell overhead

extractor/monitor 201 may also provide <u>error counts</u> from each switch network copy",

5:2-4, noting further that Boduch also discloses "The best cell copy selection ... can

alternatively be implemented by discrete hardware components", 4:5-8, implying said

"cell overhead extractor/monitor 201" may be separated into discrete *first/second circuit*

of two circuits, each handling *first/second set of output digital audio streams*); *and*

   a logic circuit (a necessary *logic circuit* in said "best cell copy selection ASIC

110" for the ASIC to perform the function to be cited below) *to receive error signal from*

said first error *check circuit and a second* error *check signal from said second* error

check circuit, said logic circuit determining, based upon said first error *signal received*

from said first error *check circuit and said second* error *signal receive from said second*

error *check circuit, whether to assert said switching signal* (see "the best cell copy

selection ASIC 110 <u>invokes</u> the copy selector 206 to select the better of the two copies

of each cell to be sent on to the customer network. The term 'better' refers to the cell

that arrives at egress port module 109 of FIG. 1 with <u>fewest errors</u>", 10:35-39, noting

that said <u>invoke</u> or *assert* will have to be performed necessarily by a *logic circuit* in said

ASIC 110).

   Regarding claim 4, *wherein said output card* (fig. 1 "ASIC 110" within "egress

port module 109") *further comprises: a first/second delay circuit* (fig. 2 "CDV FIFO

function 204" and see "The CDV FIFO function 204 is used to absorb <u>cell delay</u>

variation imparted by a single switch network", 8:26-27) *coupled to receive said*

first/second set of M output digital audio data streams from said first/second router

matrix card (noting in fig. 2 said "CDV FIFO function 204" receiving data stream

220/221, which are the same as data stream 111/112 from "switch network copies

107/108");

said switching circuit (fig. 2 "copy selector 206") *coupled to receive a first set of M*

output digital audio data streams from said first router matrix card and said second set

of M output digital audio data streams from said second router matrix card via said first

delay circuit and said second delay circuit, respectively (refer to fig. 2 and see "the copy

selector 206 to select the better of the two copies of each cell to be sent on to the

customer network", 10:36-38, and fig. 2 depicting that the selector receives data

streams *via* said "CDV FIFO function 204").

Regarding claim 6, *wherein said logic circuit asserts said switching signal based*

upon detection of said error in said selected one of said first and second sets of M

output digital audio data streams (see fig. 6B for logic at step 605 "cell from network

copy A arrives with bit error status bit set to FALSE?" and the "No" branch thereof,

indicating copy A has error and leading to possibly switching to copy B at step 609) *only*

if an error is not present in said unselected one of said first and second sets of M output

digital audio data streams (see fig. 6B for logic at step 609 in above "No" branch "cell

from network copy B arrives with bit error status bit set to FALSE" and the "Yes" branch

thereof, leading to step 610 "cell from copy B selected", while the "No" branch of step

609 branching to step 607 "cell from preferred copy selected", which "is the switch

network copy from which the last cell was sent on to the customer network", 11:57-59).

Regarding claim 7, *wherein said switching circuit switches back from said*

unselected one of said first and second sets of M output digital audio data streams to

said selected one of said first and second sets of M output digital audio data streams

based upon assertion of said switching signal (see "the selection is made on a <u>cell-by-</u>

cell basis", 10:39-40, which, following the steps in fig. 6B, will necessarily switch back-and-forth).

Regarding claim 8, *wherein said logic circuit* (the necessary *logic circuit* in said "best cell copy selection ASIC 110" for the ASIC to perform the function cited above for claim 3 and the function to be cited below) *asserts said switching signal based upon detection of an error in said unselected one of said first and second sets of output digital audio data streams* (see "the best cell copy selection ASIC 110 <u>invokes</u> the copy selector 206 to select the better of the two copies of each cell to be sent on to the customer network. The term 'better' refers to the cell that arrives at egress port module 109 of FIG. 1 with <u>fewest errors</u>", 10:35-39, noting that said <u>invoke</u> or *assert* bi-directionally: *selected* ↔ *unselected*).

Regarding claim 9, *wherein said logic circuit* (the necessary *logic circuit* in said "best cell copy selection ASIC 110" for the ASIC to perform the function cited above for claim 3 and the function to be cited below) *asserts said switching signal based upon detection of an error in said unselected one of said first and second sets of output digital audio data streams* (see fig. 6B for logic at step 605 "cell from network copy A arrives with bit error status bit set to FALSE?" and the "No" branch thereof, indicating copy A has error) *only if no error is present in said selected one of said first and second of output digital streams* (see fig. 6B for logic at step 609 in above "No" branch "cell from network copy B arrives with bit error status bit set to FALS?" and the "Yes" branch thereof, leading to step 610 "cell from copy B selected", while the "No" branch of step

609 branching to step 607 "cell from preferred copy selected", which "is the switch

network copy from which the last cell was sent on to the customer network", 11:57-59).

Regarding claim 17, *wherein said output card is further configured to continue*

providing as the output therefrom the unselected one of said first and second set of M

parity encoded output digital audio streams, even if no further parity is detected in said

selected one of said first and second sets, unless a parity error is detected in said

unselected one of said first and second sets (see firstly "to determine which switch

network copy is the master, the CDV FIFO function 204 first determines which switch

network copy is 'bad'", 9:31-33, and secondly "if only one switch network copy is bad,

the bad switch network copy is the slave, and the other switch network copy is the

master. If both switch network copies are bad or if both switch network copies are not

bad, the title of 'master' stays with the previous master switch network copy", 9:48-52,

noting that, as discussed above, the "better" copy, in this case the "master" copy, is

selected for transmission *unless* the master becomes bad.)

Boduch does not disclose, for all claims discussed hereinabove, *1.* said

input/output cell streams to/from said switch network copies 107/108 are *parity encoded*

streams and/or *2.* said error based on which said selection/switching is made is *a parity*

error.

However, in general *parity encoding* is a well known, well established and widely

used error detection/correction technique in the art, as Newton's Telecom Dictionary

(16th Edition, February 2000, ISBN # 1-57820-053-9) recites, "**Parity** A process for

detecting whether bits of data (parts of characters) have been altered during

transmission of the data. Since data is transmitted as a stream of bits with values of one

or zero, each character of data composed of, say seven bits has another bit added to it.

The value of that bit is chosen so that either the total number of one bits is always even

if Even Parity error correction is to be obeyed or always Odd if Odd Parity error

correction is chosen" (p.632, right column, the entry for **Parity**). Therefore, it would have

been obvious, in general, for one skilled in the art at the time of the invention to have

easily thought of incorporating *parity encoding* and *parity error checking*, as an

alternative or addition, to Boduch already disclosed error checking/correction method in

order to provide more ways of data stream selection. It should be noted that such

addition would necessarily result in *M* parity encoded <u>output streams</u> from *N* parity

encoded <u>input streams</u>.

Below is a particular example of use of such *parity encoding* technique.

Humphrey discloses "a system for selecting one of two or more parallel planes of

data" (Abstract lines 1-2) which "allows planes to be switched on a packet-by-packet

basis" (1:65-67) wherein data are generated using a "data formatter circuit 84" (10:59

and fig. 4) comprising using *parity error* checking and *parity encoding* (see fig. 4, "parity

check 120" logic and "DS0 parity generation 126" circuits, noting especially the feature

of <u>9 input</u> streams thereto and <u>10 output</u> streams therefrom).

Therefore, it would have also been obvious, in particular, to one of ordinary skill

in the art at the time of the invention to modify the method/system of Boduch by adding

the particular parity generating and checking method of Humphrey to Boduch in order to

provide a better system "that substantially eliminates or reduces disadvantages and

problems associated with previously developed systems and methods for data plane

selection", as pointed out by Humphrey (1:39-42).

3.   Claims 11 – 16 and 19 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Boduch in view of Humphrey and further in view of Hurlocker (US

6,320,860)

- **With respect to Independent claims 11 and 19**

    Boduch provides a "method and apparatus for selecting the better of two or more

copies of any given cell from the received cell streams" (2:28-30) comprising the

following features:

    Regarding claim 11 / 19, *for a router* (see "a cell-oriented redundant switching

system", Abstract line 3 and fig. 1) *having an input card* (fig. 1 "ingress port module

104"), *a first router matrix card and a second router matrix card* (fig. 1 items 107 and

108 and see "there are two copies of a redundant switch network, switch network copy

107 and switch network copy 108", 3:38-39, noting that each of said copies is fed into a

"STS mapping 225" card, fig. 2, of which the structure is further detailed in fig. 4), *said

input card transmitting a set of N input digital-audio / digital data streams* (refer to fig. 1

item 103 and see "a signal 103 comes into the redundant switching system 100 to an

ingress port module 104. Signal 103 may be a SONET <u>stream</u> consisting of multiple

<u>STS-N</u> payloads. The ingress port module 104 splits the signal 103", 3:39-43) *to said

first router matrix card and said second router matrix card* (still refer to fig. 1 and see

"The ingress port module 104 splits the signal 103 into two identical signals, signal 105

and signal 106", 3:42-44, and "signal 105 and signal 106 are passed to redundant

switch network copies 107 and 108, respectively", 3:51-52), *said first router matrix card*

outputting a first set of M output digital-audio / digital data streams and said second

router matrix outputting a second, replicated set of M output digital-audio / digital data

streams (refer to fig. 1 and see "After signal 105 is <u>input</u> to switch network copy 107, the

signal is routed through switch network copy 107 and <u>output</u> as signal 111. After signal

106 is <u>input</u> to switch network copy 107, the signal is routed through switch network

copy 108 and <u>output</u> as signal 112", 3:59-64), *a method of selecting one of said first and*

second sets of M output digital-audio / digital data streams as the output of said router

(refer still to fig. 1 and see "The egress port module 109 determines whether signal 111

or signal 112 will be sent on to the customer's network as <u>output signal</u> 113", 3:65-67),

comprising:

   propagating said first set of M output digital-audio / digital data streams through

at least one component of said firs router matrix card (fig. 1 depicting input stream 105

passing through network copy 107);

   each one of said at least one component of said first router matrix card adding at

least one bit of information (refer to fig. 2 which "depicts a block diagram of the cell

stream alignment best cell copy selection ASIC 110", 4:44-45, note "Cell Over Head

Extract/Monitor 201" and see "The cell overhead extractor/monitor 201 may also provide

<u>error counts</u> for each stream emanating from <u>each</u> switch network <u>copy</u>", 5:2-4, noting

that said <u>error counts</u> must be based on *bit of information* being *added to said first set of*

data streams by the *component* <u>prior to</u> said cell overhead extractor/monitor, as implied

"the composite cell stream errors being determined by devices external to the best cell

copy selection [ASIC 110 of fig. 1] itself", 6:6-8, noting that the only possible *component*

external thereto will have to be within "switch network copies 107 and 108" as depicted

in fig. 1);

propagating said second set of M output digital-audio / digital data streams

through at least one component of said second router matrix card (fig. 1 depicting input

stream 106 passing through network copy 108);

each one of said at least one component of said second router matrix card

adding at least one bit of information (refer to fig. 2 which "depicts a block diagram of

the cell stream alignment best cell copy selection ASIC 110", 4:44-45, note "Cell Over

Head Extract/Monitor 201" and see "The cell overhead extractor/monitor 201 may also

provide error counts for each stream emanating from each switch network copy", 5:2-4,

noting that said error counts must be based on *bit of information* being *added to said*

first set of data streams by the *component* prior to said cell overhead extractor/monitor,

as implied "the composite cell stream errors being determined by devices external to the

best cell copy selection [ASIC 110 of fig. 1] itself", 6:6-8, noting that the only possible

component external thereto will have to be within "switch network copies 107 and 108"

as depicted in fig. 1);

selecting one of said first and second sets of M output digital-audio / digital data

streams as the output of said router based upon a comparison of said at least one bit of

information added to said first set of M output digital-audio / digital data streams to said

at least one bit of information added to said second set of M output digital-audio / digital

data streams (still refer to figs. 1 and 2 and see "the best cell copy selection ASIC 110

invokes the copy selector 206 to select the better of the two copies of each cell to be

sent on to the customer network. The term 'better' refers to the cell that arrives at

egress port 109 of FIG. 1 with fewest errors, and the selection is made on a cell-by-cell

basis" 10:35-40, noting that the term cell-by-cell basis will inevitably involving *switching*

from previously *selected streams* to previously *unselected streams*, depending on which

of the two copies of the next cell has fewest errors in it).

Boduch does not disclose, regarding claims 11 / 19, "cell-oriented redundant

switching system" (*router*) is a *broadcast* router.

Humphrey discloses "a system for selecting one of two or more parallel planes of

data" (Abstract lines 1-2) which "allows planes to be switched on a packet-by-packet

basis" (1:65-67) consisting of an "optical fiber-capable telecommunication switch system

10 (fig. 1) further comprising the following features:

Regarding claims 11 / 19, said switch system being a *broadcast router* (refer to

fig. 1 and see "Fiber optic connection unit 14 receives digitally encoded optical data

from fiber optic conductor 18, performs broadcast switching of the data streams

received from fiber optic conductor 18", 4:5-8).

It would have also been obvious to one of ordinary skill in the art at the time of

the invention to modify the method/system of Boduch by adding the broadcast feature of

Humphrey to Boduch in order to provide a better system "that substantially eliminates or

reduces disadvantages and problems associated with previously developed systems

and methods for data plane selection", as pointed out by Humphrey (1:39-42).

As discussed above, Boduch discloses "provide <u>error counts</u> for each stream emanating from <u>each</u> switch network <u>copy</u>" reading on *each one of said at least one component of said first* and *second router matrix card adding at least on bit of information.* Boduch however does not disclose said "error counts" information being added **<u>to</u>** said first and second set of M output digital audio-data / digital streams propagating therethrough (Boduch's error count is provided, as depicted in fig. 2 therein, <u>externally</u> to "copy selector 206" using signal line 207 carrying "CDV FIFO status" signal).

Hurlocker discloses an invention that "is to provide ATM path switched ring switching criteria" (1:23-24) wherein path determination "comprises the steps of computing a running average of a sum of path bit-interleaved-parity (BIP) error counts for each right segment and selecting the preferred ring segment as the one having the lowest BIP error count" (1:37-40) using "ring segment OAM system management cell" (fig. 1) comprising the following features:

Regarding claims 11 / 19, each node adding one bit of information **<u>to</u>** said first and second set of M output digital-audio / digital data streams (note firstly fig. 1 depicting a "segment BIP" field in the "ring segment OAM system management cell", and secondly in view of fig. 2 and see for each intermediate node such as nodes 14, 16, 18 in fig. 1 "ten millisecond running average of the SONET/SDH path BIP error count is added to the ring segment BIP count in an incoming ring segment OAM cel and the sum is used as the new ring segment BIP count in the outgoing ring segment OAM cell", 2:58-62; and finally see, in view of fig. 1 "At the output node 18, containing two BIP

output processors, one 36 for path 20, on 34 for path 22, 24 and 26, a service selector

can choose the better side by comparing the ring segment BIP counts. The selector can

switch, for example, on loss of ring segment OAM cell or segment BIP", 2:66 – 3:3).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to further modify the method of Boduch by adding the in-frame error indicator

of Hurlocker to Boduch in order to build more efficient and effective "solution to provide

fast switching independent of the cell traffic" (Burlocker, 1:15-16).

- **With respect to Dependent claims**

    Boduch discloses the following features:

    Regarding claim 12, *wherein said at least one bit of information is comprised of*

    at least one status bit (see fig. 6B logic steps 605, 606 and 609 all discloses checking if

    "cell from network copy A/B arrives with bit error <u>status bit</u> set to FALSE?").

    Regarding claim 13, *wherein said at least one bit of information is comprised of*

    at least one health bit (see fig. 6B logic steps 605, 606 and 609 all discloses checking if

    "cell from network copy A/B arrives with bit error <u>status bit</u> set to FALSE?", which status

    comprises also the condition of cell sequence number "out of seq" as depicted fig. 3

    block 301).

    Regarding claim 14, *wherein selecting one of said first and second sets of M*

    output digital audio data streams as the output of said router further comprises:

        determining a first/second sum by adding said at least one bit added to said

    first/second set of M output digital audio data streams (refer to fig. 2 and see "The cell

    overhead extractor/monitor may also provide <u>error counts</u> for each stream emanation

from each switch network copy", 5:2-4, which <u>error counts</u> will, as obvious to one skilled in the art, necessarily involve *determining a sum by adding said bit*).

Selecting one of said first and second sets of N output digital audio data streams as the output of said router based upon a comparison of said first sum to said second sum (see "the best cell copy selection ASIC 110 invokes the copy selector 206 to select the better of the two copies of each cell to be sent on to the customer network. The term 'better' refers to the cell that arrives at egress port module 109 of FIG. 1 with <u>fewest errors</u>", 10:35-39, noting such determination for <u>fewest errors</u> will have to first make *a comparison of the* error *sums* of the two streams).

Regarding claim 15, *the method of claim 11, and further comprising:*

checking a *first and second set of M output digital audio data streams for errors* (refer to fig. 2 and see "The cell overhead extractor/monitor 201 may also provide error counts for each stream emanating from each switch network copy", 5:2-4)

selecting one of said first and second sets of M output digital audio data streams as the output of said router (refer to fig. 1 and see "The egress port module 109 determines whether signal 111 or signal 112 will be sent on to the customer's network as out put signal 113", 3:64-67) based upon the presence of errors in said first set of N output digital audio data streams (refer to figs. 1 and 2 and see "the best cell copy selection ASIC 110 invokes the copy selector 206 to select the better of the two copies of each cell to be sent on to the customer network. The term 'better' refers to the cell that arrives at egress port 109 of FIG. 1 with <u>fewest errors</u>, and the <u>selection</u> is made on a <u>cell-by-cell basis</u>" 10:35-40) ... and said comparison of said at least one bit of

information added to said first set of M output digital audio data streams to said at least

one bit of information added to said second set of M output digital audio data streams

(refer to fig. 6B and see steps 605, 606 and 609 showing checking and comparing "dell

from network copy A or B arrives with bit error <u>status bit</u> set to FALSE?").

Regarding claim 16, *the method of claim 15, wherein selecting one of said first*

and second sets of M output digital audio data streams as the output of said router

further comprises:

determining a first/second sum by adding said at least one bit added to said

first/second set of M output digital audio data streams (refer to fig. 2 and see "The cell

overhead extractor/monitor may also provide <u>error counts</u> for each stream emanation

from each switch network copy", 5:2-4, which <u>error counts</u> will, as obvious to one skilled

in the art, necessarily involve *determining a sum by adding said bit*).

selecting, one of said first and second sets of M output digital audio data

streams as the output of said router (refer to fig. 1 and see "The egress port module 109

determines whether signal 111 or signal 112 will be sent on to the customer's network

as out put signal 113", 3:64-67) *based on ... and a comparison of said first sum to said*

second sum (see "the best cell copy selection ASIC 110 invokes the copy selector 206

to select the better of the two copies of each cell to be sent on to the customer network.

The term 'better' refers to the cell that arrives at egress port module 109 of FIG. 1 with

<u>fewest errors</u>", 10:35-39, noting such determination for <u>fewest errors</u> will have to first

make *a comparison of the* error *sums* of the two streams).

Boduch does not disclose the following features: <u>regarding claim 15</u>, *encoding*

parity information into said first/second set of N input digital audio data streams prior to

transmission of said input digital audio data streams to said first/second router matrix of

said first/second router matrix card, said first/second set of M output digital audio data

streams output from said first/second router matrix being a first/second set of M parity

encoded digital audio data streams; selecting parity encoded streams based upon ...

the presence of parity errors in said second set of N output streams; <u>regarding claim 16</u>,

said selecting *based upon the presence of parity errors in said first/second set of M*

parity encoded output data streams.

Humphrey teaches the above features missing from Boduch, particularly:

Regarding claim 15, *encoding parity information into said first/second set of N*

input digital audio data streams prior to transmission of said input digital audio data

streams to said first/second router matrix of said first/second router matrix card, said

first/second set of M output digital audio data streams output from said first/second

router matrix being a first/second set of M parity encoded digital audio data streams;

and *selecting parity encoded streams based upon ... the presence of parity errors in*

said second set of N output streams.

Regarding claim 16, said selecting *based upon the presence of parity errors in*

said first/second set of M parity encoded output data streams

(see fig. 4 for "parity check 120" circuit and "DS0 parity generation 126" circuits,

noting especially the feature of <u>9 input</u> streams thereto and <u>10 output</u> streams

therefrom, and see further "DS-0 parity generation is performed by DS-0 parity

generation circuit 126. This DS-0 format data is transmitted in a 10-bit parallel data

stream from data formatter circuit 84", 11:23-26).

Also, in general *parity encoding* is a well known, well established and widely

used error detection/correction technique in the art, as Newton's Telecom Dictionary

(16th Edition, February 2000, ISBN # 1-57820-053-9) recites, "**Parity** A process for

detecting whether bits of data (parts of characters) have been altered during

transmission of the data. Since data is transmitted as a stream of bits with values of one

or zero, each character of data composed of, say seven bits has another bit added to it.

The value of that bit is chosen so that either the total number of one bits is always even

if Even Parity error correction is to be obeyed or always Odd if Odd Parity error

correction is chosen" (p.632, right column, the entry for **Parity**). Therefore, it would have

been obvious, in general, for one skilled in the art at the time of the invention to have

easily thought of incorporating *parity encoding* and *parity error checking*, as an

alternative or addition, to Boduch already disclosed error checking/correction method in

order to provide more ways of data stream selection. It should be noted that such

addition would necessarily result in *M parity encoded output streams* from *N parity*

encoded input streams.

It would have also been obvious, in particular, to one of ordinary skill in the art at

the time of the invention to modify the method/system of Boduch by adding the

particular parity generating and checking method of Humphrey to Boduch in order to

provide a better system "that substantially eliminates or reduces disadvantages and

problems associated with previously developed systems and methods for data plane

selection" (Humphrey, 1:39-42).

Allowable Subject Matter

4.   Claims 5 and 10 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

Claims 5/10 essentially feature the same functionalities of signal switching in two

opposite direction with claims 5/10 switching from "selected/unselected" to

"unselected/selected" data streams "regardless whether a parity error is present in said

unselected/selected one of said first and second sets of M parity encoded output digital

audio data streams".

While Boduch in view of Humphrey discloses signal selection and switching, said

prior arts, believed to be the closest, provide selecting based always upon determining

which signal is better and thus fail to disclose switching *regardless whether a parity*

error is present in redundant copy of the signal.

Response to Arguments

5.   Applicant's arguments filed on 1/23/2008 regarding claim 1 have been fully

considered but they are not persuasive.

Applicant argues (page 14 second paragraph) "Neither Boduch nor Humphrey

teach, show, or suggest a switching matrix defined as NxM".

Examiner respectfully disagrees with this argument. Boduch clearly shows MxN

of 12x1 matrix card in fig. 4, which is a detailed view of the "STS mapping" card 225 in

fig. 2 comprised of "sequence manager 203", "CDV FIFO function 204" and "byte

interleaver 205". These elements intake and output, as discussed above in paragraphs

2 and 3, "composite cell streams". Additionally, Humphrey also discloses NxM of 32x10

"data conversion" block in fig. 4 thereof.

6.   Applicant's arguments filed on 1/23/08, with respect to claim 5 and additionally

claim 10 have been fully considered and are persuasive. The rejection of claims 5 and

10 has been withdrawn.

7.   Applicant's arguments with respect to claim 11 have been considered but are

moot in view of the new ground(s) of rejection.

Applicant argues (page 15 second paragraph) "Boduch ... makes it clear that the

'cell overhead extractor/monitor 201' takes information out of the cell stream and stores

that information in registers in order to maintain the status information. At no point in the

cited or uncited portions of Boduch is there a teaching or remote suggestion that the cell

overhead extractor/monitor adds information to the cell streams, as defined by

Applicant's claim 11".

Newly found art of Hurlocker discloses said feature and render the argument

moot.

Conclusion

8.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW LAI whose telephone number is (571)272-9741. The examiner can normally be reached on M-F 7:30-5:00 EST, Off alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew Lai/
Examiner, Art Unit 2616

/Kwang B. Yao/
Supervisory Patent Examiner, Art Unit 2616